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ABSTRACT

A response to Richard E. Clark's conclusion that media research needs to stop emphasizing descriptive research and focus on prescriptive research designs and questions, this paper reiterates the distinctions between disciplines and applied fields of study, and suggests that these distinctions should be evident in the descriptive/prescriptive research reports generated for each; imparts the author's belief that replicating the theoretical and inquiry strategies of descriptive research may be debilitating to applied research; and discusses instruction in reality and the implications of a holistic research paradigm to study learning from instruction. The paper argues that commitment in the past to the constructs imposed by a particular discipline has failed to produce the consistency, generality, and commonality needed for the development of a comprehensive paradigm for applied research on learning from instruction. It also warns that research without a theoretical domain may provide new directions that are no more beneficial as a guide than the paths of the past, and that, although applied research in this area should be based upon the constructs of learning/cognitive theory, instructional theory should not be confused with learning/cognitive theory. A research paradigm is presented which is based on the presumption that there is both theoretical and intuitive commonality among the researchers and practitioners interested in learning from research. It is noted that such a paradigm needs to be broad enough to include psychological, sociological, and physiological experimental and naturalistic research interests, and dynamic enough to allow for the inclusion of various theories pertaining to how, when, where, and why learners become competent. (8 references) (BBM)

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Extrapolating From Richard E. Clark's Argument

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In recent years, researchers in our field have been engrossed in ongoing arguments about the value of research with media, research on media, and research on learning from media. Richard Clark, for example, has expended untold hours explaining the effects created by the gap between descriptive theory and applied research (Clark & Snow, 1975). Among other claims (Clark, 1983), Clark has concluded that ". . . media attributes are interchangeable and make no necessary psychological contribution to learning" (Clark, 1987). Based upon the available evidence, this, of course, is true. However, what Richard Clark did not tell us is that media attributes may make a sociological and/or physiological contribution to learning. He did not tell us this because, for many reasons, we did not ask the question. As a result, one is led to the conclusion that our narrowly focused questions may be a cause for concern (Clark, 1988).

Last year, Clark (1989) concluded that ". . . research quantity indicators do not support quality judgments." He went on to say that two major changes need to occur in the way that research is conducted in the future. First, ". . . more effort needs to be spent at the 'front end' or conceptualization stage of studies" and second, ". . . our studies need to stop emphasizing descriptive research and instead focus on prescriptive research designs and questions."

My purpose is threefold. One is to reiterate the distinctions between disciplines and applied fields of study and suggest that these distinctions should be evident in the descriptive/prescriptive research reports generated from each. A second is to impart my belief that replicating the theoretical and inquiry strategies of descriptive research may be debilitating applied research. A third is to discuss instruction in reality and the implications of a holistic research paradigm to study learning from instruction (The paradigm even includes the teacher/designer as an essential variable).

DISCIPLINES AND APPLIED FIELDS

Education is an applied field of study. Therefore, if education is an applied field of study, like medicine and law (not a discipline, like mathematics and chemistry), then so are the knowledge components that comprise it: instruction, curriculum, counseling, evaluation, and administration (Beauchamp, 1968).

In the classical sense, a discipline of knowledge includes research based upon mature theories that will encompass and/or correspond with both existing and new microtheories and macrotheories; the general concern is with delineating mature theories that must specify the dynamic causal relationships that exist within, between, and among all of the elements comprising the domain. Traditionally, the goal of basic research have been to generate new descriptive knowledge, if, for no other reason, the sake of knowing.

Generally, an applied field of study includes research based upon knowledge gleaned from one or more disciplines; the concern is with identifying eclectic systems, networks, paradigms, et cetera, to infer the ideal structure of functional, reality ladened, knowledge. The goal of applied research, in most cases, has been to generate new knowledge about designing, developing, implementing, managing, and/or evaluating the effective (natural science) and/or affective (social science) elements within the universe.

Therefore, the task of researchers and other professionals within an applied field of study is to translate and transform the "knowing what" descriptive knowledge generated in the disciplines to the "knowing how" prescriptive knowledge so necessary in an applied field of study. One must remember that the major difference between basic descriptive research and applied prescriptive research is reality. I mention the distinction only because it is so easy to lose sight of our purpose.

THE PROBLEM OF PURPOSE

It is my belief that at least part of the "purpose" problem, if it is generally conceived to be a problem, stems from the fact that many of the graduate programs of education (an applied field of study) have mirrored the theoretical and methodological inquiry strategies and techniques of science (a discipline). It follows, then, that our orientations about the theoretical constructs of research, in general, and methodology, in particular, have reflected and evolved from the "laboratory setting," where conditions and

methods can usually be controlled, through statistics and/or randomization, to ignore potential dynamic causal relationships that exist within the domain of reality, but outside the domain of immediate concern or interest to the researcher. In reality, I am not implying that this model or the descriptive data that result from research conducted in a laboratory setting are good or bad; that question cannot be answered until we have incorporated and evaluated these data in our own applied research, in reality. Some would argue that this is an extension of the controversy between reductionists and naturalists (Guba, 1981; Magoon, 1977), while others will see it as a distinction between the professional research activities of those in a discipline and those in an applied field of study.

To summarize, the task of synthesizing descriptive data from the "root social sciences" (Clark, 1989) to form a usable paradigm for applied research is quite different than the task of employing, verbatim, the theoretical and methodological constructs of those same sciences. Certainly learner competence is a goal or end product that applied fields concerned with instructional theory hold in common with the root social sciences concerned with learning/cognitive theory, but the means of arriving at the end product is, or should be, different.

In the past, our commitment to the constructs imposed by a particular discipline has failed to produce the consistency, generality, and commonality needed for the development of a comprehensive paradigm for applied research on learning from instruction. Frustration with the limited yields from past research has prompted calls for new research directions. However, research without a theoretical domain may provide new directions which are no more beneficial as a guide to studying learning from instruction than the paths of the past. In the future, the relationship between learning/cognitive theory research and learning from instruction research must be reciprocal; each should serve, in part, to strengthen the other. Without some acknowledgement of the effective and affective processes involved in learning from instruction, applied research efforts will continue to produce extremely limited observations. Learning from instruction should be based, in part, upon the constructs of learning/cognitive theory, but instructional theory should not be confused with learning/cognitive theory.

INSTRUCTION IN REALITY

Perhaps the most pervasive problem with research on learning from instruction has been the lack of inclusiveness; our inattention to the totality of the instructional environment. Separately, we have covered several

variables, usually more than one at a time, including learners, teachers, treatment characteristics, environmental or situational conditions, intrinsic and extrinsic motivation, media characteristics, and factors related to the instructional message or task. Research has been conducted from the individual researcher's conception of fundamental combinations of pertinent variables. Based upon what we have learned from our past research, it seems that one of the shortcomings has been our failure to consider certain variables and relationships that have been treated and evaluated by our colleagues in the disciplines and other applied fields. To illustrate, the learning/cognitive theorist does not focus on the specific elements of one essential component within a learning/cognitive model at the expense of the others. For, by themselves, the essential components are not theory: even though the within component elements play an integral part in defining a theoretical domain, in the final analysis, they often become subordinate to the relationships between and among component elements. This should also be the case with paradigms to study learning from instruction.

A PARADIGM TO STUDY LEARNING FROM INSTRUCTION

Although the paradigm described here has implications for instructional design, it is neither an instructional design paradigm nor a paradigm of instruction; rather, it is a research paradigm to study learning from instruction. The paradigm is based upon the presumption that there is both theoretical and intuitive commonality among the researchers and practitioners interested in learning from instruction. Therefore, for such a paradigm to be of value to all researchers within our applied field of study, it must be eclectic. It must be broad enough to include our psychological, sociological, and physiological experimental and naturalistic research interests, and dynamic enough to allow for the inclusion of various theories pertaining to how, when, where, and why learners become competent.

The clinical paradigm proposed here to study learning from instruction is based upon five essential variables of instruction: the learner, the teacher/designer, the task, the resources, and the instructional environment. It follows, then, that if learner competence is the ultimate product of the instructional environment, then an effective and affective instructional environment is the product of the interactions from within, between, and among the teacher/designer, the learner, the task, and the resources. The psychological, sociological, and physiological dimensions of the variables of instruction are used to further describe the distinctiveness of the static and dynamic attributes innately existing within, or designed into, each of the essential variables. Even though the proposed dimensions may not be

mutually exclusive, this deficiency is minimized by viewing learning from instruction as a dynamic process. However, this should not be construed to mean that the dynamic and static attributes existing within, or designed into, the psychological, sociological, and physiological dimensions of the essential variables of instruction are not important indicators of potential interactions. They are, in fact, of great import to our efforts in diagnosing and prescribing the between and among relationships of the identified attributes associated with each of the variables of instruction.

On the one hand, learner competence is contingent upon the ability of the motivated learner to select, amplify, and/or manipulate the attributes of the other variables of instruction to form an environment that is *qualitatively* distinct. On the other hand, learner competence is contingent upon the ability of the teacher/designer to select, amplify, and/or manipulate the attributes of the other variables of instruction to form an environment that is *quantitatively* distinct. The implication of such within, between, and among dependence of the learner and the teacher/designer is that causal relationships within the instructional environment result from the abilities of the learner to integrate the functional relationships between and among the other variables in a schema that will result in a theoretically predictable performance. Functional relationships of the dynamic and static attributes within each variable and causal relationships between and among the variables of instruction and learner competence are best predicted from knowledge about the intermediary processes that occur within the learner as well as the potential effective and/or affective relationships that occur between and among all of the other variables of instruction. Hence, the objective form and subjective meaning of the learning task must yield both functional and causal distinctions in terms of the cognitive, affective, and/or psychomotor requirements of the learner.

Research proceeding from this conceptual level requires not only the examination of the essential variables of instruction (teacher/designer, learner, task, resources, and the instructional environment) and their attributes (psychological, sociological, and physiological), but of the essential intermediary processes (functional and causal relationships) as well. Together, these essential variables can serve as common denominators for a variety of research interests in applied fields such as instructional technology. Moreover, theoretical integrity would be established and/or advanced if these components were either implicit or explicit features of most, if not all, research paradigms.

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